

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listing of claims in the application:

LISTING OF CLAIMS:

Claim 1 (Currently amended) A method for bulk separation of single-walled tubular fullerenes based on helicity, comprising the steps of:

providing in a fluid a plurality of single-walled tubular fullerenes being of a multiplicity of different helicities, each of said plurality of single-walled tubular fullerenes having a longitudinal axis ~~differing helicity~~;

providing a crystalline substrate having an upper surface whose atomic lattice structure and an exposed upper surface in a plane of said upper surface provides at least one energetically favored angular orientation of said longitudinal axis with respect to an axis of said lattice structure for single-walled tubular fullerenes of one helicity to be adsorbed thereto in preference to single-walled tubular fullerenes of other helicities;

establishing a flow of said fluid for transporting said plurality of single-walled tubular fullerenes with said longitudinal axes thereof in substantially parallel relationship, one with respect to another, and substantially aligned with a direction of said flow of said fluid;

directing ~~[[a]]~~ said flow of said fluid containing said plurality of single-walled tubular fullerenes ~~across~~ in parallel with said upper surface of said substrate and in contact therewith to pass into an effluent receiver disposed adjacent to a perimeter of said substrate, said flow being ~~parallel with said upper surface of said substrate and at an angle with respect to an axis of said lattice structure of said substrate, said angle being selected to attract in said at least one energetically favored angular orientation to thereby preferentially adsorb and hold said single-walled tubular fullerenes of a predetermined said one helicity to said upper surface of~~ said substrate; and,

removing said single-walled tubular fullerenes held to said upper surface of said substrate.

Claim 2 (Currently amended) The method as recited in Claim 1, wherein the step of ~~directing~~ establishing a flow of said fluid is preceded by the step of dissolving at least a portion of said plurality of single-walled tubular fullerenes in ~~[[a]]~~ said fluid.

Claim 3 (Currently amended) The method as recited in Claim 1, wherein the step of ~~directing~~ establishing a flow of said fluid is preceded by the step of suspending at least a portion of said plurality of single-walled tubular fullerenes in ~~[[a]]~~ said fluid.

Claims 4-6 (Cancelled).

Claim 7 (Currently amended) The method as recited in Claim [[6]] 1, wherein the step of ~~aligning~~ establishing a flow includes the step of forming a confinement-based alignment through at least one outlet passage.

Claim 8 (Original) The method as recited in Claim 7, wherein said at least one outlet passage has a diameter less than one thousand times greater than a diameter of said single-walled tubular fullerenes.

Claim 9 (Currently amended) The method as recited in Claim [[6]] 1, wherein the step of ~~aligning~~ establishing a flow includes the step of forming an extensional flow through at least one outlet passage.

Claim 10 (Original) The method as recited in Claim 9, wherein the step of forming an extensional flow includes the step of forming a constriction region within said outlet passage.

Claim 11 (Original) The method as recited in Claim 10, wherein the step of forming a constriction region includes the step of forming said outlet passage with an open bottom juxtaposed on said substrate to define a closed contour passage.

Claim 12 (Original) The method as recited in Claim 1, wherein the step of providing a plurality of single-walled tubular fullerenes includes the step of functionalizing said plurality of single-walled tubular fullerenes with molecular groups having one of a high electric or magnetic susceptibility.

Claim 13 (Currently amended) The method as recited in Claim 12, wherein the step of ~~directing~~ establishing a flow a flow of said fluid includes the step of using at least one electric or magnetic field directed across said fluid flow to align ~~said aligning~~ longitudinal axes of said plurality of single-walled tubular fullerenes with ~~[[a]]~~ said direction of said flow of said fluid ~~using at least one electric or magnetic field directed across said fluid flow.~~

Claims 14-16 (Cancelled).

Claim 17 (Currently amended) The method as recited in Claim 1, wherein the step of ~~directing~~ establishing a flow a flow of said fluid is preceded by the step

of suspending said plurality of single-walled tubular fullerenes in a liquid crystal material.

Claim 18 (Currently amended) The method as recited in Claim 1, wherein the step of ~~directing~~ establishing a flow a flow of said fluid is preceded by the step of providing an outlet passage with an open bottom juxtaposed on said substrate to thereby form a closed contour passage.

Claim 19 (Currently amended) A system for bulk separation of single-walled tubular fullerenes based on helicity, comprising:

a container of a fluid bearing single-walled tubular fullerenes, said single-walled tubular fullerenes being of a multiplicity of different helicities and each of said single-walled tubular fullerenes having a longitudinal axis;

a dispensing assembly having at least one outlet for discharging said fluid bearing single-walled tubular fullerenes in a directed flow and at least one inlet coupled in fluid communication with said container and spaced from said outlet, said dispensing assembly including means for aligning said longitudinal axes of said single-walled tubular fullerenes in substantially parallel relationship and in a direction of said directed flow of said fluid;

a crystalline substrate having an atomic lattice structure ~~and~~ with an axis defined in a plane of an exposed upper surface thereof, disposed in relation to said outlet of said dispensing assembly being positioned with respect to said substrate for said directed flow of said fluid to be in parallel with said upper surface of said substrate and in contact therewith,

wherein said ~~lattice structure of said substrate having a selected axis of said~~ atomic lattice structure is disposed in ~~an~~ a predetermined angular relationship with respect to said directed flow of said fluid from said at least one outlet of said dispensing assembly, said ~~axis being at an angle~~ angular relationship being selected to ~~attract~~ energetically favor adsorption of said single-walled tubular fullerenes of one helicity in preference to single-walled tubular fullerenes of other helicities, said energetically favored adsorption being sufficient to ~~and~~ hold said single-walled tubular fullerenes of said one a predetermined helicity to said upper surface of said substrate as ~~the~~ said fluid bearing single-walled tubular fullerenes flows across said upper surface of said substrate; and,

a drainage assembly disposed adjacent to a portion of said substrate distal from said dispensing assembly for ~~carrying off~~ receiving any of said fluid bearing single-walled tubular fullerenes not held on said upper surface of said substrate.

Claim 20 (Cancelled).

Claim 21 (Currently amended) The system as recited in Claim ~~[[20]]~~ 19, wherein said alignment means includes at least one outlet passage disposed in fluid communication with said at least one outlet of said dispensing assembly, said at least one outlet passage being adapted to form a confinement-based alignment therethrough.

22. (Original) The system as recited in Claim 21, wherein said at least one outlet passage has a diameter less than one thousand times greater than a diameter of said single-walled tubular fullerenes.

23. (Currently amended) The system as recited in Claim 20, ~~further comprising a container of~~ wherein said fluid includes a liquid crystal material combined with, ~~said alignment means including means for combining said single-walled tubular fullerenes with said liquid crystal material~~ to suspend said single-walled tubular fullerenes therein, said suspension being flowed ~~over~~ across said upper surface of said substrate said substrate.

24. (Currently amended) The system as recited in Claim 19, wherein said at least one outlet of said dispensing assembly is defined by an outlet passage with an open bottom juxtaposed on top of said substrate.

25. (Currently amended) The system as recited in Claim ~~[[20]]~~ 19, wherein said alignment means includes an emission system in proximity to at least one outlet passage disposed in fluid communication with said at least one outlet of said dispensing assembly, said emission system exposing said fluid bearing single-walled tubular fullerenes to one of a magnetic field or an electric field to align said longitudinal axes of said single-walled tubular fullerenes with said flow.

26. (Currently amended) The system as recited in Claim 19, further comprising a turntable for displaceably supporting said substrate thereon.